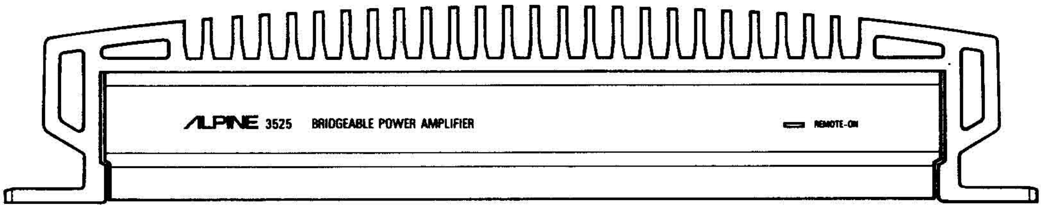
ALPINE

SERVICE MANUAL

Power Amplifier


ALPINE 3525 BRIDGEABLE POWER AMPLIFIER
REMOTE-ON

3525

Contents

Specifications 2
Parts Locations 3
Block Diagram 4
Schematic Diagram .... 5 to 6
Parts Layout on P.C.Boards and Wiring Diagram .... 7 to 8
Exploded View (Cabinet) .... 9 to 10
Cabinet Assembly Parts List 11
Electrical Parts List .... 11 to 13
Semi-Conductor Lead Identifications .... 14 to 16
Packing Method View 17
Packing Assembly Parts List 17

Specifications

Power Source	14.4 V DC(11 ~ 16 V)
Polarity	Negative ground
Current Drain	1500 mA
Power Output	70 W/2 ch
Input Sensitivity	0.5 V ± 2 dB(Fix position) 2 V ± 2 dB(Variable position)
Frequency Response	20 Hz to 40 K Hz
Residual Noise	2 mV
Separasion	55 dB
Input Impedance	10 K ohm ± 2 K ohm
Semiconductors	4 IC's, 35 Transistors, 23 Diodes 6 Zener Diodes, 1 LED
Dimention	276 (W) × 160 (D) × 53 (H) mm
Weight	2.2 kg

NOTE : Due to continuing product improvement, spcifications and design subject to change without notice.

Parts Locations

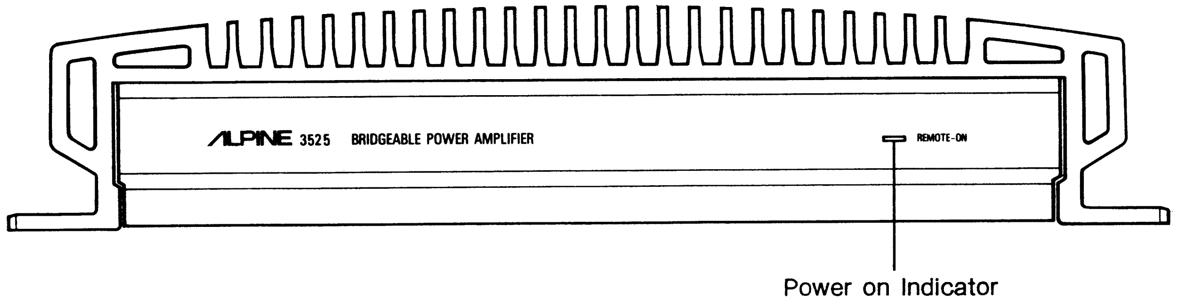

ALPINE 3525
BRIDGEABLE POWER AMPLIFIER
REMOTE-ON
Power on Indicator

Figure 1

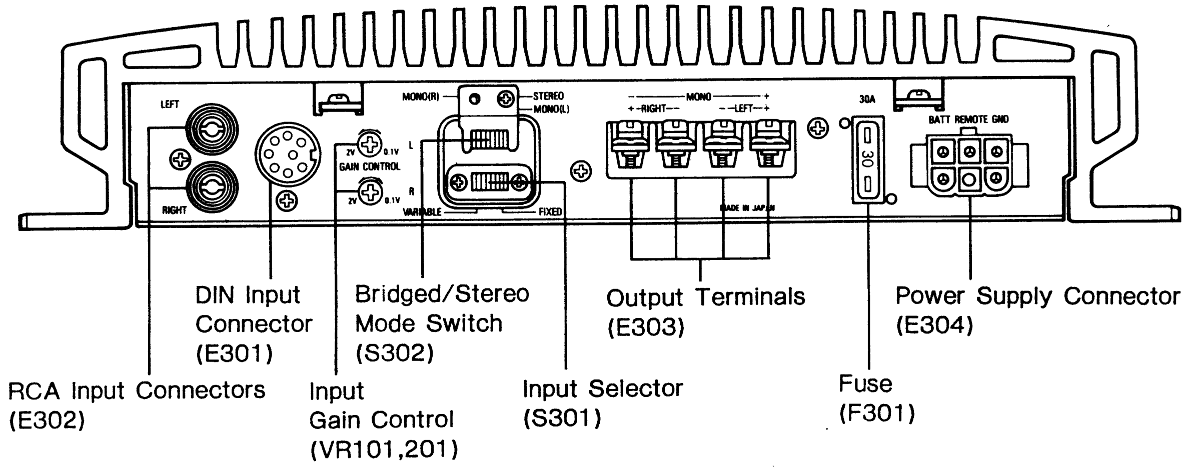
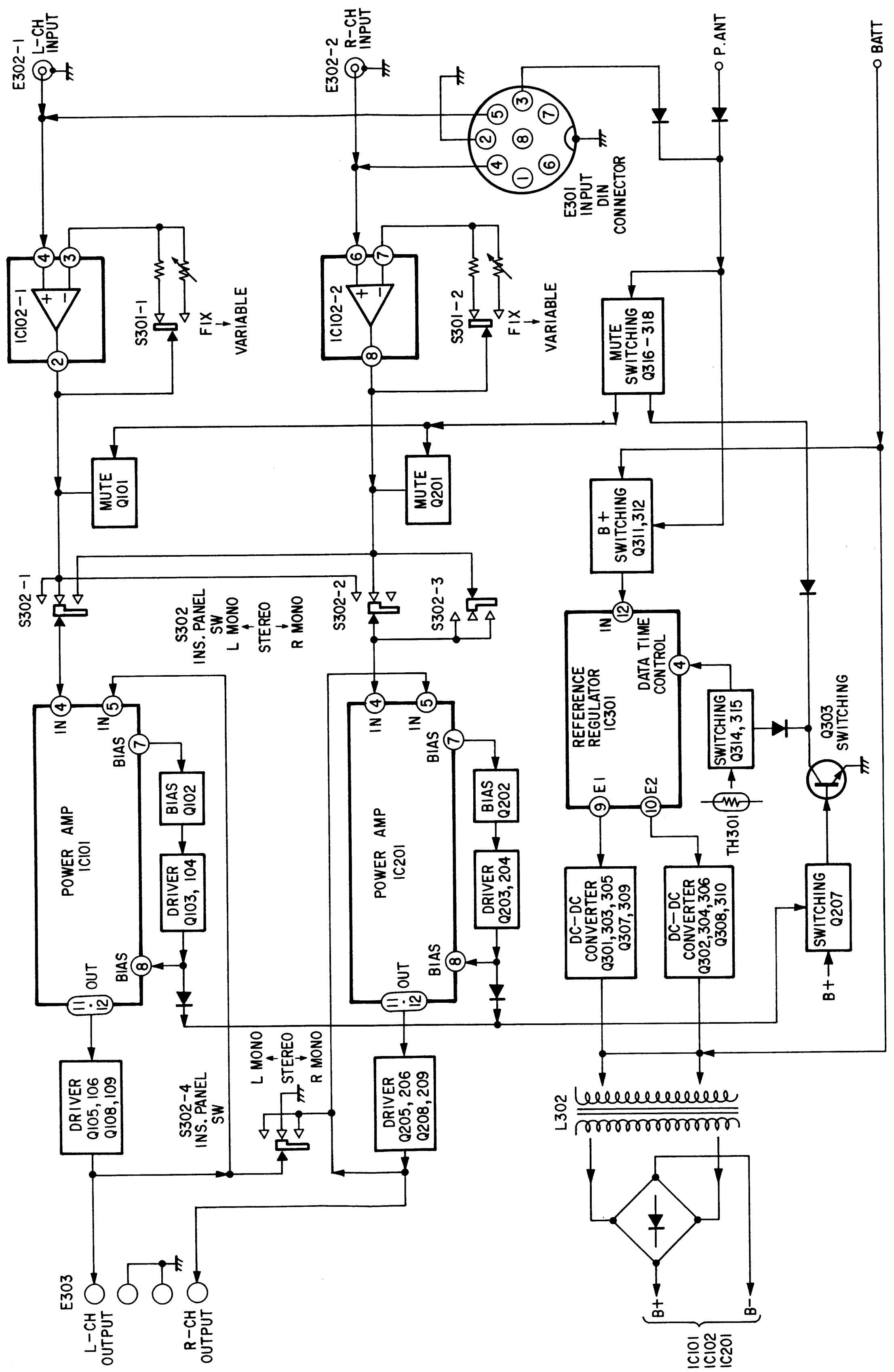
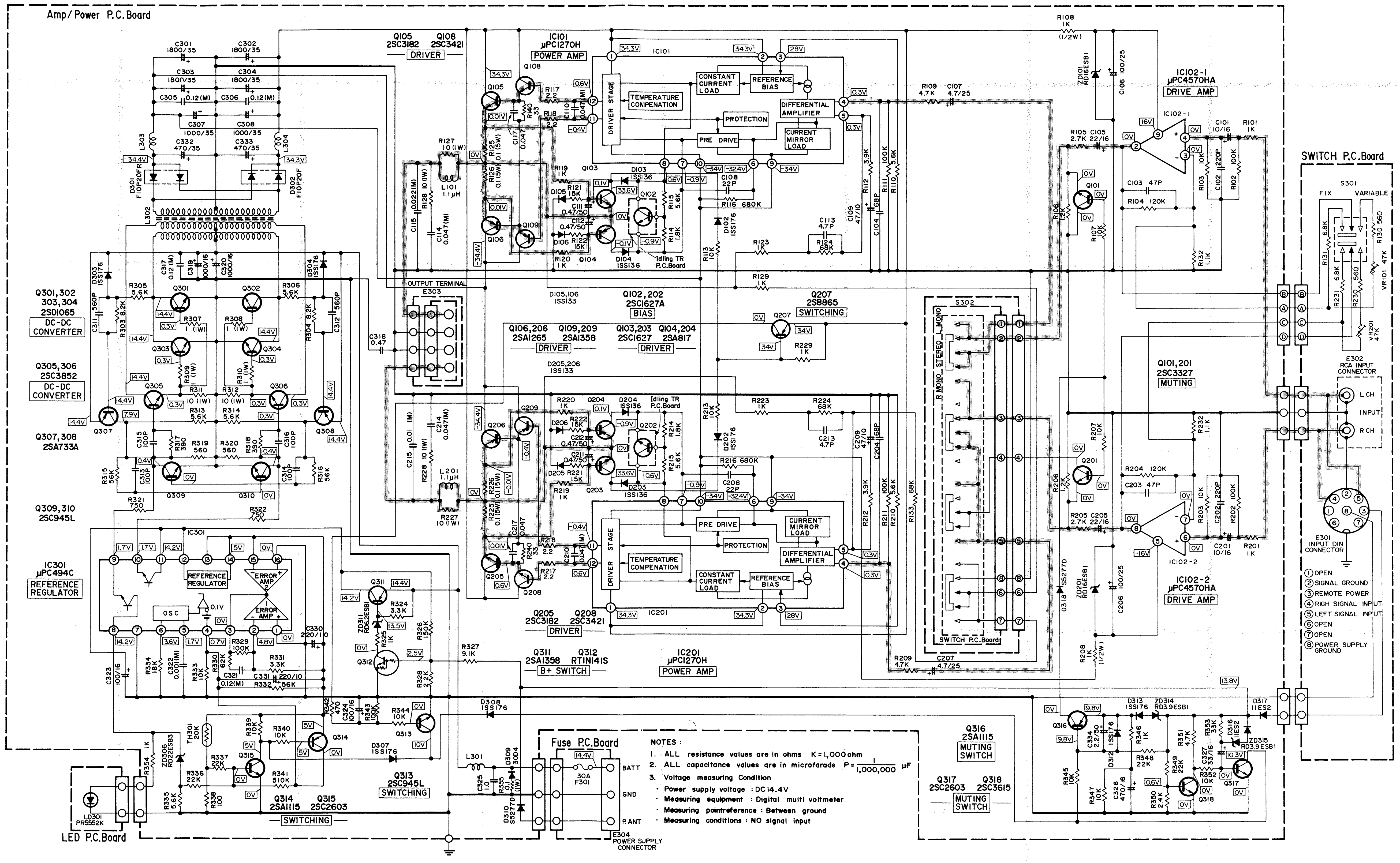

LEFT
RIGHT
MONO(R)
STEREO
MONO(L)
2V
0.1V
L
R
GAIN CONTROL
VARIABLE
FIXED
MONO
RIGHT
LEFT
30A
BATT REMOTE GND
MADE IN JAPAN
DIN Input Connector (E301)
Bridged/Stereo Mode Switch (S302)
Output Terminals (E303)
Power Supply Connector (E304)
RCA Input Connectors (E302)
Input Gain Control (VR101,201)
Input Selector (S301)
Fuse (F301)

Figure 2

Block Diagram


E302-1
L-CH INPUT
E302-2
R-CH INPUT
P.ANT
BATT
E301 INPUT DIN CONNECTOR
IC102-1
IC102-2
S301-1
S301-2
FIX
VARIABLE
MUTE SWITCHING Q316-318
MUTE Q101
MUTE Q201
B+ SWITCHING Q311,312
S302-1
S302-2
S302-3
S302 INS. PANEL SW
L MONO
STEREO
R MONO
REFERENCE REGULATOR IC301
DATA TIME CONTROL
IN
E1
E2
SWITCHING Q314,315
Q303 SWITCHING
TH301
POWER AMP IC101
POWER AMP IC201
IN
BIAS
OUT
BIAS Q102
BIAS Q202
DRIVER Q103,104
DRIVER Q203,204
DC-DC CONVERTER Q301,303,305 Q307,309
DC-DC CONVERTER Q302,304,306 Q308,310
SWITCHING Q207
B+
DRIVER Q105,106 Q108,109
DRIVER Q205,206 Q208,209
S302-4 INS. PANEL SW
L302
B+
B-
IC101 IC102 IC201
E303
L-CH OUTPUT
R-CH OUTPUT

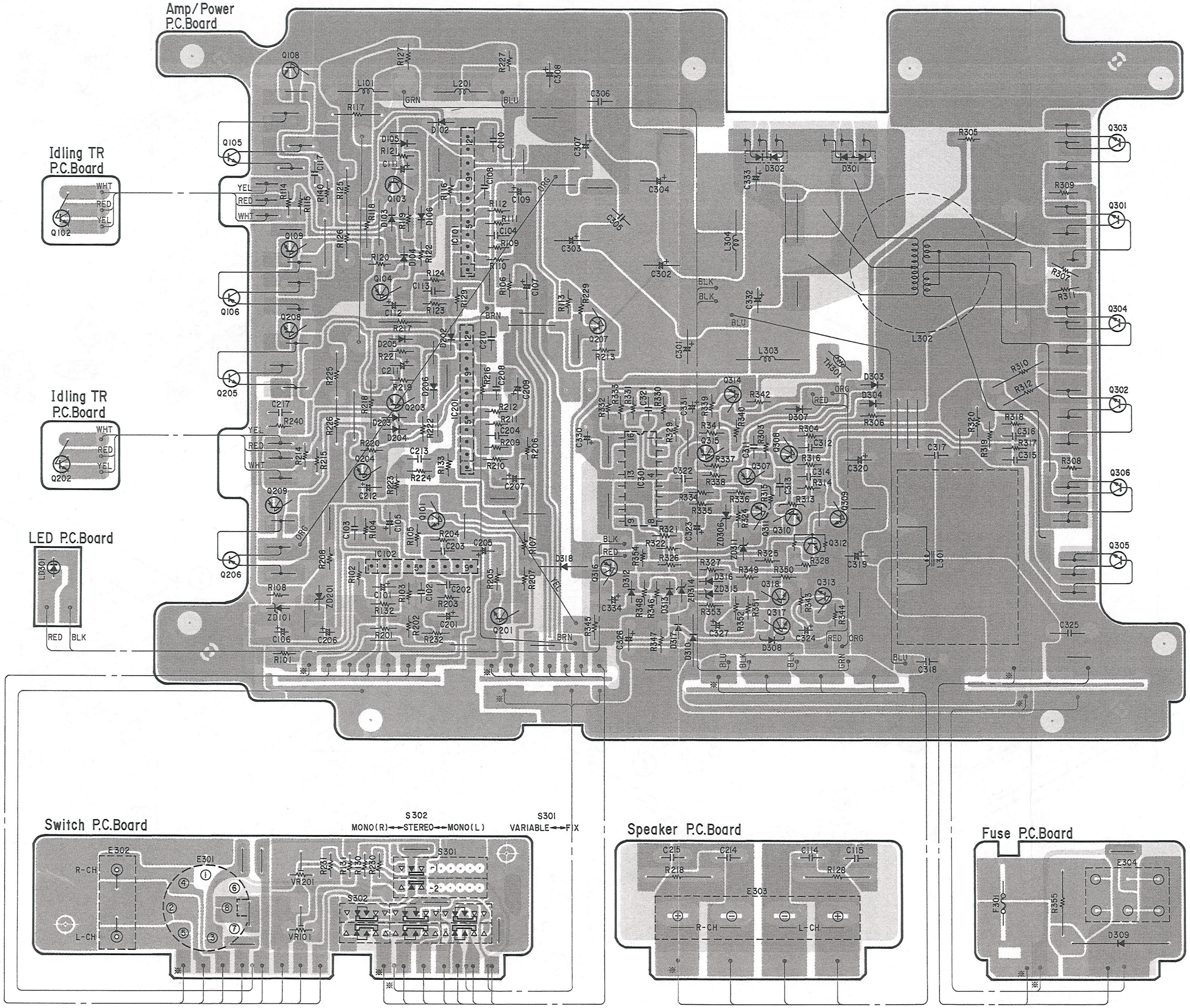
Schematic Diagram


Amp/Power P.C.Board
SWITCH P.C.Board
Fuse P.C.Board
LED P.C.Board
Q105 2SC3182 Q108 2SC3421 DRIVER
IC101 μPC1270H POWER AMP
Q205 2SC3182 Q208 2SC3421 DRIVER
IC201 μPC1270H POWER AMP
IC102-1 μPC4570HA DRIVE AMP
IC102-2 μPC4570HA DRIVE AMP
Q101,201 2SC3327 MUTING
Q102,202 2SC1627A BIAS
Q106,206 2SA1265 Q109,209 2SA1358 DRIVER
Q103,203 2SC1627 Q104,204 2SA817 DRIVER
Q207 2SB865 SWITCHING
Q301,302 303,304 2SD1065 DC-DC CONVERTER
Q305,306 2SC3852 DC-DC CONVERTER
Q307,308 2SA733A
Q309,310 2SC945L
IC301 μPC494C REFERENCE REGULATOR
Q311 2SA1358 Q312 RTIN141S B+ SWITCH
Q313 2SC945L SWITCHING
Q314 2SA1115 Q315 2SC2603 SWITCHING
Q316 2SA1115 MUTING SWITCH
Q317 2SC2603 Q318 2SC3615 MUTING SWITCH
OUTPUT TERMINAL E303
CONSTANT CURRENT LOAD
REFERENCE BIAS
TEMPERATURE COMPENATION
DRIVER STAGE
PROTECTION
DIFFERENTIAL AMPLIFIER
PRE DRIVE
CURRENT MIRROR LOAD
REFERENCE REGULATOR
ERROR AMP
OSC
S302
MONO
STEREO
R MONO L MONO
SWITCH P.C.Board
S301 FIX VARIABLE
E302 RCA INPUT CONNECTOR
L CH
INPUT
R CH
E301 INPUT DIN CONNECTOR
①OPEN
②SIGNAL GROUND
③REMOTE POWER
④RIGH SIGNAL INPUT
⑤LEFT SIGNAL INPUT
⑥OPEN
⑦OPEN
⑧POWER SUPPLY GROUND
30A F301
BATT
GND
P.ANT
E304 POWER SUPPLY CONNECTOR
LD301 PR5552K

NOTES :

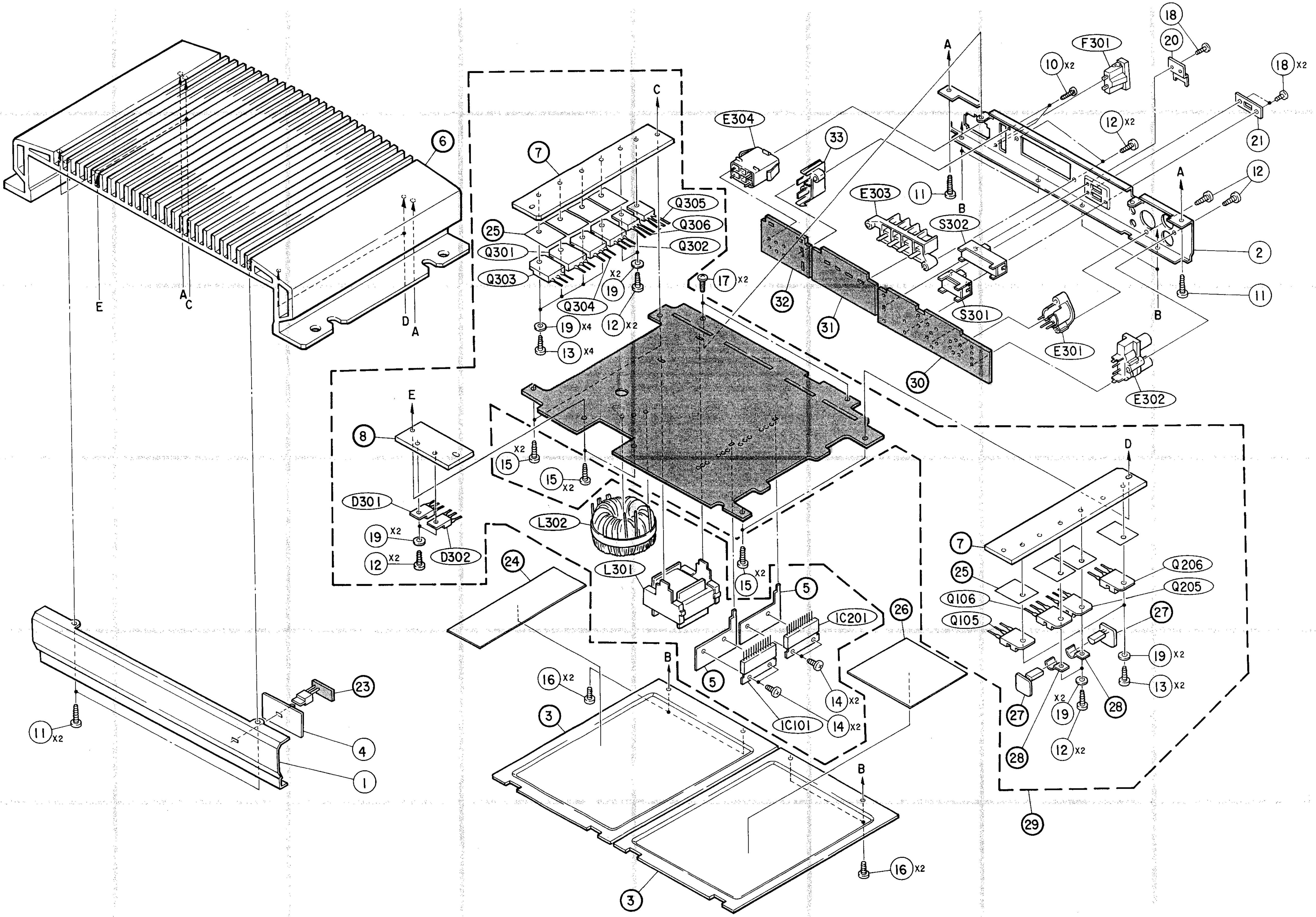
1. ALL resistance values are in ohms K = 1,000 ohm
2. ALL capacitance values are in microfarads $P = \frac{1}{1,000,000}$ μF
3. Voltage measuring Condition
   - Power supply voltage : DC14.4V
   - Measuring equipment : Digital multi voltmeter
   - Measuring pointreference : Between ground
   - Measuring conditions : NO signal input

Parts Layout on P.C. Boards and Wiring Diagram


Amp/Power P.C.Board
Idling TR P.C.Board
Idling TR P.C.Board
LED P.C.Board
Switch P.C.Board
S302
MONO(R)←→STEREO←→MONO(L)
S301
VARIABLE←→FIX
R-CH
L-CH
Speaker P.C.Board
R-CH
L-CH
Fuse P.C.Board
WHT
RED
YEL
BLK
GRN
BLU
BRN
ORG

BLU	Blue
GRN	Green
BLK	Black
GRY	Gray
WHT	White
RED	Red
BRN	Brown
ORG	Orange
YEL	Yellow
VIO	Violet
PNK	Pink

Exploded View (Cabinet)


6
A
C
D
A
E
7
C
Q305
Q306
25
Q302
Q301
Q303
X2
19
Q304
12 X2
19 X4
13 X4
17 X2
E304
33
E303
11
B
S302
S301
32
31
30
E301
E302
A
F301
10 X2
18
20
18 X2
12 X2
21
A
12
2
11
B
8
E
D301
19 X2
12 X2
D302
15 X2
15 X2
L302
L301
15 X2
24
5
IC201
5
IC101
14 X2
14 X2
26
16 X2
3
B
3
16 X2
D
7
25
Q206
Q205
Q106
Q105
27
19 X2
13 X2
27
28
X2
19
12 X2
28
29
23
4
1
11 X2

Cabinet Assembly Parts List

Symbol No.	Index	Part No.	Description		
1	5-C	27E04870S01	Chassis, Front		
2	2-H	27E04871S01	Chassis, Rear		
4	5-C	15B70599F01	Cover, LED		
10	1-G	03E04876S01	Screw, Pan (M2×6)		
11	5-A	03E04877S01	Screw, Pan (M2.6×6)		
12	4-C	03E04878S01	Screw, Pan (M3×8)		
13	3-D	03E04879S01	Screw, Pan (M3×10)		
14	5-F	03E04880S01	Screw, Pan (M3×5)		
15	4-D	03E04881S01	Screw, Bind (M2.6×12)		
16	5-D	03E04882S01	Screw, Bind (M2.6×5)		
17	2-E	03E04883S01	Screw, Bind (M2.6×6)		
18	1-H	03E04884S01	Screw, Pan (M2.6×4)		
19	4-C	04E04885S01	Washer, Flat(M3×8)		
20	1-H	07A73138F01	Bracket, SW Lock		
21	2-H	14A73139F01	Insulator, SW Lock		
33	2-F	65E04899S01	Holder, Auto Fuse		

NOTE : The parts without part numbers are not supplied.

Electrical Parts List

Abbreviations

RES. =Resistor
C.F. =Carbon Film
M.F. =Metal Film
M.O. =Metal Oxide Film
M.P. =Metal Plate
TR. =Transistor
TRANS. =Transformer
CP. =Chip

CAP. =Capacitor
ELY. =Electrolytic
CER. =Ceramic
MYL. =Mylar
TAN. =Tantalum
POLY. =Polystyrol
PP. =Polypropylene
PLT. =Polyethylene

Symbol No.	Part No.	Description		
Amp/Power P.C.Board				
IC's				
IC102	51T83403F03	μPC4570HA		
IC301	51T70759F01	μPC494C		
Transistors				
Q101	48E03491S01	2SC3327		
Q103	48E04056S01	2SC1627		
Q104	48E04055S01	2SA817		
Q108	48T69176F01	2SC3421		
Q109	48T69177F01	2SA1358		
Q201	48E03491S01	2SC3327		
Q203	48E04056S01	2SC1627		
Q204	48E04055S01	2SA817		
Q207	48E04811S01	2SB865		
Q208	48T69176F01	2SC3421		
Q209	48T69177F01	2SA1358		
Q307	48T40081T03	2SA733A		
Q308	48T40081T03	2SA733A		
Q309	48S44578J01	2SC945L		
Q310	48S44578J01	2SC945L		
Q311	48T69177F01	2SA1358		
Q312	48E03490S01	RT1N141S		
Q313	48S44578J01	2SC945L		
Q314	48E03814S01	2SA1115		
Q315	48T50625F01	2SC2603		
Q316	48E03814S01	2SA1115		
Q317	48T50625F01	2SC2603		
Q318	48E04812S01	2SC3615		
Diodes				
ZD101	48T68702F59	Zener, RD16ESB1		
D102	48T58583F01	1SS176		
D103	48T70933F01	1SS136		
D104	48T70933F01	1SS136		
D105	48T68828F01	1SS133		

Resistors: Carbon resistors under ¼ watts are not mentioned in the parts list, please confirm them by schematic diagram.
uF = microfarads, pF = picofarads

Symbol No.	Part No.	Description		
D106	48T68828F01	1SS133		
ZD201	48T68702F59	Zener, RD16ESB1		
D202	48T70933F01	1SS176		
D203	48T70933F01	1SS136		
D204	48T70933F01	1SS136		
D205	48T68828F01	1SS133		
D206	48T68828F01	1SS133		
D303	48T58583F01	1SS176		
D304	48T58583F01	1SS176		
ZD306	48T68702F70	Zener, RD22ESB3		
D307	48T58583F01	1SS176		
D308	48T58583F01	1SS176		
D310	48E03485S01	S5277D		
ZD311	48T68702F29	Zener, RD6.2ESB1		
D312	48T58583F01	1SS176		
D313	48T58583F01	1SS176		
ZD314	48E04813S01	Zener, RD3.9ESB1		
ZD315	48E04813S01	Zener, RD3.9ESB1		
D316	48T84052F01	11ES2		
D317	48T84052F01	11ES2		
D318	48E03485S01	S5277D		
Thermistor				
TH301	48T60670F01	TD5-C320DA2 20K ohm		
Coils				
L101	24E04814S01	Output, 1.1μH		
L201	24E04814S01	Output, 1.1μH		
L303	24E04815S01	Choke, 200μH		
L304	24E04815S01	Choke, 200μH		
Capacitors				
C101	23E04816S01	ELY., 10μF/16V		
C102	21E04817S01	CER., 220pF		
C103	21E04818S01	CER., 47pF		
C104	21E04819S01	CER., 68pF		
C105	23E04820S01	ELY., 22μF/16V		
C106	23E04821S01	ELY., 100μF/25V		
C107	23E04822S01	ELY., 4.7μF/25V		
C108	21E04823S01	CER., 22pF		
C109	23E04824S01	ELY., 47μF/10V		
C110	08E04825S01	MYL., 0.047μF		
C111	23E04826S01	ELY., 0.47μF/50V		
C112	23E04826S01	ELY., 0.47μF/50V		
C113	21E04827S01	CER., 4.7pF		
C117	08E04825S01	MYL., 0.047μF		
C201	23E04816S01	ELY., 10μF/16V		
C202	21E04817S01	CER., 220pF		
C203	21E04818S01	CER., 47pF		
C204	21E04819S01	CER., 68pF		
C205	23E04820S01	ELY., 22μF/16V		
C206	23E04821S01	ELY., 100μF/25V		

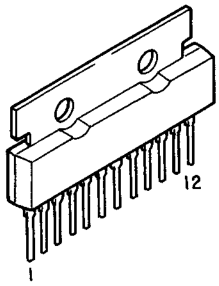
Symbol No.	Part No.	Description		
C207	23E04822S01	ELY., 4.7μF/25V		
C208	21E04823S01	CER., 22pF		
C209	23E04824S01	ELY., 47μF/10V		
C210	08E04825S01	MYL., 0.047μF		
C211	23E04826S01	ELY., 0.47μF/50V		
C212	23E04826S01	ELY., 0.47μF/50V		
C213	21E04827S01	CER., 4.7pF		
C217	08E04825S01	MYL., 0.047μF		
C301	23E04828S01	ELY., 1800μF/35V		
C302	23E04828S01	ELY., 1800μF/35V		
C303	23E04828S01	ELY., 1800μF/35V		
C304	23E04828S01	ELY., 1800μF/35V		
C305	08E04854S01	TF., 0.12μF		
C306	08E04855S01	TF., 0.12μF		
C307	23E04829S01	ELY., 1000μF/35V		
C308	23E04829S01	ELY., 1000μF/35V		
C311	21E04830S01	CER., 560pF		
C312	21E04830S01	CER., 560pF		
C313	21E04831S01	CER., 100pF		
C314	21E04831S01	CER., 100pF		
C315	21E04831S01	CER., 100pF		
C316	21E04831S01	CER., 100pF		
C317	08E04854S01	TF., 0.12μF		
C318	08E04856S01	TF., 0.47μF		
C319	23E04832S01	ELY., 1000μF/16V		
C320	23E04832S01	ELY., 1000μF/16V		
C321	08E04854S01	TF., 0.12μF		
C322	08E04857S01	PP., 0.001μF		
C323	23E04833S01	ELY., 100μF/16V		
C324	23E04833S01	ELY., 100μF/16V		
C325	08E04858S01	Film 1μF		
C326	23E04834S01	ELY., 470μF/16V		
C327	23E04835S01	ELY., 33μF/16V		
C330	23E04836S01	ELY., 220μF/10V		
C331	23E04836S01	ELY., 220μF/10V		
C332	23E04837S01	ELY., 470μF/35V		
C333	23E04837S01	ELY., 470μF/35V		
C334	23E04838S01	ELY., 2.2μF/50V		
Resistors				
R108	06E04839S01	1K ohm 1/2W		
R125	06E04840S01	0.1 ohm		
R126	06E04840S01	0.1 ohm		
R127	06E04841S01	10 ohm 1W		
R208	06E04839S01	1K ohm 1/2W		
R225	06E04840S01	0.1 ohm		
R226	06E04840S01	0.1 ohm		
R227	06E04841S01	10 ohm 1W		
R307	06E04842S01	1 ohm 1/2W		
R308	06E04842S01	1 ohm 1/2W		
R309	06E04842S01	1 ohm 1/2W		
R310	06E04842S01	1 ohm 1/2W		
R311	06E04841S01	10 ohm 1W		
R312	06E04841S01	10 ohm 1W		

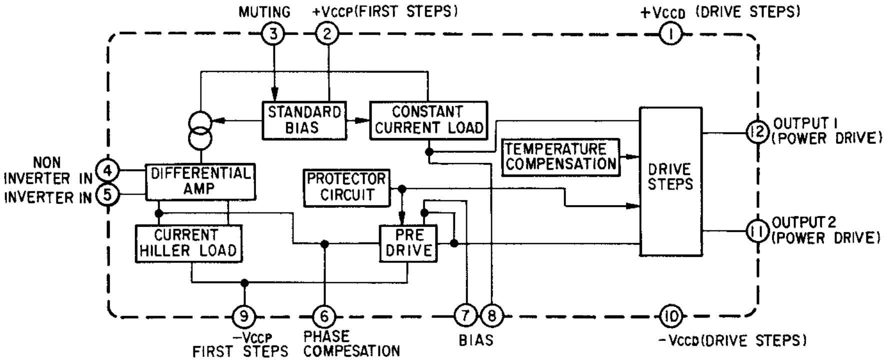
Symbol No.	Part No.	Description		
Switch P.C.Board				
Volumes				
VR101	18E04843S01	47K ohm		
VR201	18E04843S01	47K ohm		
Speaker P.C.Board				
Capacitors				
C114	08E04825S01	PP., 0.047µF		
C115	08E04859S01	PP., 0.01µF		
C214	08E04825S01	PP., 0.047µF		
C215	08E04859S01	PP., 0.01µF		
Resistors				
R128	06E04841S01	10 ohm 1W		
R228	06E04841S01	10 ohm 1W		
Fuse P.C.Board				
Diode				
D309	48T68079F03	30D4		
Resistor				
R355	06E04844S01	0.1 ohm 1W		
LED P.C.Board				
LED				
LD301	48T52238F02	PR5552K(RED)		
Idling TR P.C.Board				
Transistors				
Q102	48E04845S01	2SC1627A-Y		
Q202	48E04845S01	2SC1627A-Y		

Symbol No.	Part No.	Description		
Miscellaneous Parts				
D301	48E04803S01	Diode, F1020FR		
D302	48E04804S01	Diode, F1020F		
E301	01E04809S01	DIN Input connector		
E302	01E04810S01	RCA Input connectors		
E303	09E04902S01	Output Terminals		
E304	01E04903S01	Power Supply connector		
F301	65E05032S01	Fuse, 30A		
IC101	51E03492S01	IC, µPC1270H		
IC201	51E03492S01	IC, µPC1270H		
L301	25E04807S01	Choke Coil, TRANS.		
L302	25E04808S01	Coil, TRANS.		
O105	48T58609F01	TR., 2SC3182N		
Q106	48T58610F01	TR., 2SA1265N		
Q205	48T58609F01	TR., 2SC3182N		
Q206	48T58610F01	TR., 2SA1265N		
Q301	48T47613F01	TR., 2SD1065		
Q302	48T47613F01	TR., 2SD1065		
Q303	48T47613F01	TR., 2SD1065		
Q304	48T47613F01	TR., 2SD1065		
Q305	48T82883F01	TR., 2SC3852		
Q306	48T82883F01	TR., 2SC3852		
S301	40E04805S01	Switch, (Input Selector)		
S302	40E04806S01	Switch, (Bridged/Stereo Mode)		

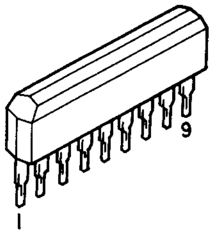
Semi-Conductor Lead Identifications

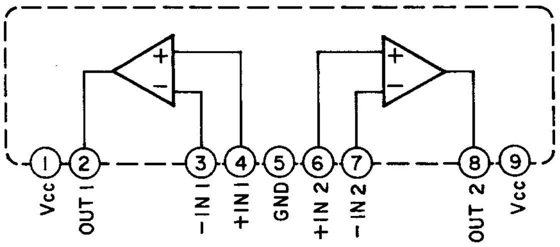
μPC1270H : IC101, 201



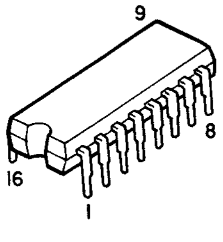

MUTING
+VCCP(FIRST STEPS)
+VCCD (DRIVE STEPS)
3
2
1
STANDARD BIAS
CONSTANT CURRENT LOAD
TEMPERATURE COMPENSATION
DRIVE STEPS
12
OUTPUT 1 (POWER DRIVE)
NON INVERTER IN
INVERTER IN
4
5
DIFFERENTIAL AMP
PROTECTOR CIRCUIT
CURRENT HILLER LOAD
PRE DRIVE
11
OUTPUT 2 (POWER DRIVE)
9
6
7
8
10
-VCCP FIRST STEPS
PHASE COMPESATION
BIAS
-VCCD(DRIVE STEPS)

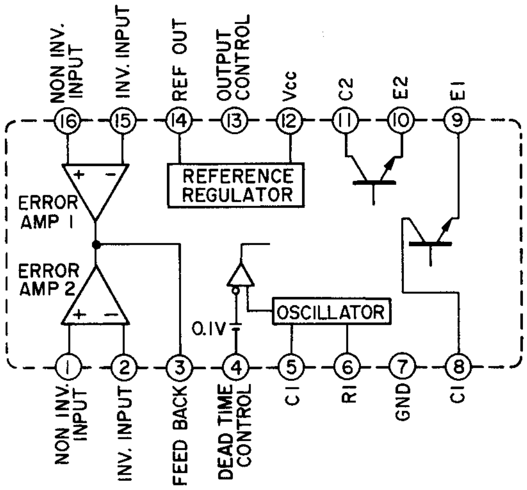
μPC4570HA : IC102



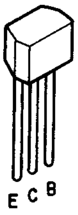

+
−
+
−
1
2
3
4
5
6
7
8
9
Vcc
OUT 1
−IN 1
+IN 1
GND
+IN 2
−IN 2
OUT 2
Vcc

μPC494C : IC301

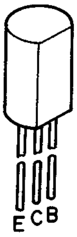



NON INV. INPUT
INV. INPUT
REF OUT
OUTPUT CONTROL
Vcc
C2
E2
E1
16
15
14
13
12
11
10
9
+
−
ERROR AMP 1
REFERENCE REGULATOR
ERROR AMP 2
+
−
0.1V
OSCILLATOR
1
2
3
4
5
6
7
8
NON INV. INPUT
INV. INPUT
FEED BACK
DEAD TIME CONTROL
CI
RI
GND
C1

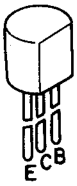
2SC3327 : Q101, 201



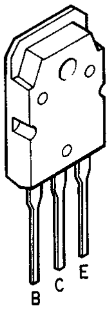
2SC1627A-Y : Q102, 202
2SB865 : Q207
2SC3615 : Q318



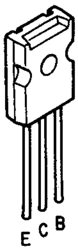
2SC1627 : Q103, 203
2SA817 : Q104, 204
2SA733A : Q307, 308
2SC945L : Q309, 310, 313



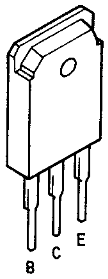
2SC3182N : Q105, 205
2SA1265N : Q106, 206



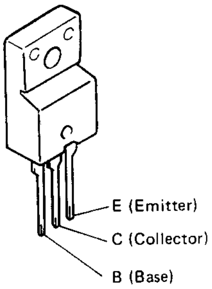
2SC3421 : Q108, 208
2SA1358 : Q109, 209, 311



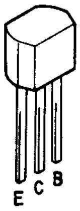
2SD1065 : Q301, 302, 303, 304

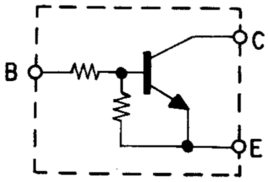


2SC3852 : Q305, 306

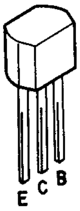

E (Emitter)
C (Collector)
B (Base)

RTN141S : Q312

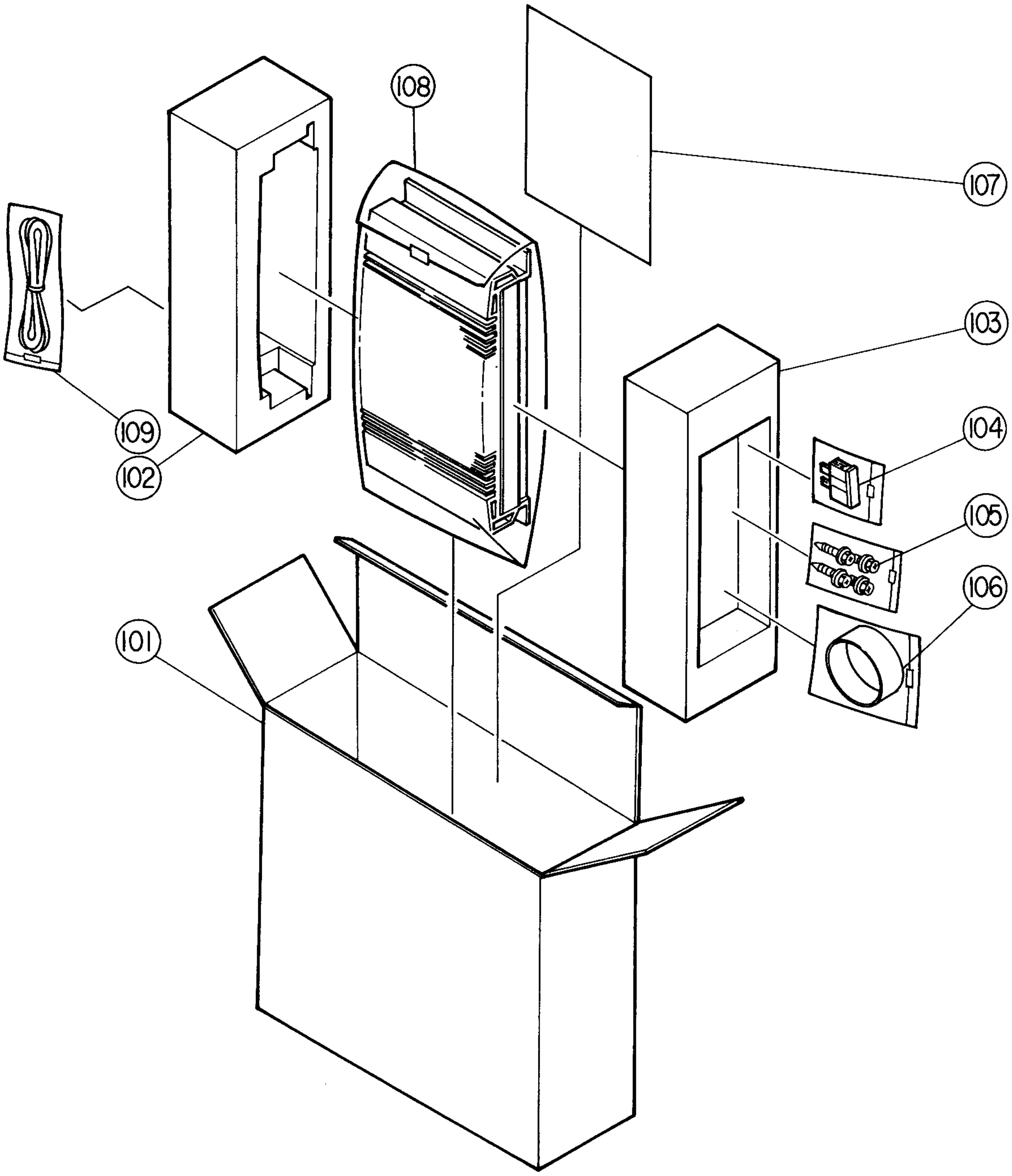




2SA1115 : Q314, 316
2SC2603 : Q315, 317



Packing Method View



Packing Assembly Parts List

Symbol No.	Part No.	Description		
● 101	56E0488S01	Carton, Packing		
■ 101	56E0488S02	Carton, Packing		
102	56E04046S01	Tray, Packing(R)		
103	56E04045S01	Tray, Packing(F)		
104	65E05032S01	Fuse, 30A		
105	03E04893S01	Screw(M4×14)		
106	15A81064F01	Housing, Rubber		

Symbol No.	Part No.	Description		
● 107	68P81880F73	Owner's Manual		
■ 107	68P81880F75	Owner's Manual		
108	56E04887S01	Sack, Polyethylene		
109	01E04064S01	Assy., Power Connector		

● : For North American model only.
■ : For European model only. Others : Common

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